Institutionen för skogens produkter och marknader

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Examensarbeten
Nr 56 2005

ISSN 1651-4467

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Examensarbete 20 poäng, D-nivå i skogshushållning
Maarten van Soest, skogsvetarprogrammet 01/05

Handledare: Roland Hörnfeldt

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Abstract

The enlargement of the European Union and effects of globalization have a large impact on the form in which the sawmill industry operates. Market expansion and merging companies are observed in the globalization effect. Multinationals in forest produce are aiming towards expanding their share in forest markets internationally, the procurement of raw materials is also internationalizing. A big inhibitor of the European market expansion is the growing industry in the southern hemisphere. Competition for the importing markets will arise and if Europe does not adapt it will not find the expansion of the industry as predicted. Pine products from the southern hemisphere are very popular import products in both Asia and America. Even in Europe there are big imports of these products. On the field of international trade a lot of gaps can be found to fulfill the predicted market expansion. Niche markets for ecologically produced European products and lobbying for the maintenance of trade barriers are main recommendations made.

Key words: Globalization, Forest products, Forest Models, Forest Economics

Acronyms

APEC	Asian Pacific Economic Cooperation
CEEC	Central and Eastern European Coalition
CEP	Closer Economic Partnership
CIS	Commonwealth of Independent States
EFISCEN	European Forest Information Scenario
EFTA	European Free Trade Association
EU	European Union
FAO	Food and Agriculture Organization
FAOSTAT	FAO Statistical database
FTA	Free Trade Agreement
FRA	Forest Resource Assessment
GTM	Global Trade Model
IFSOS	New Zealand Institute for Forest Information
INFOR	Chilean Institute for Forest Information
LVL	Laminated Veneer Lumber
MDF	Medium Dense Fiberboard
OSB	Oriented Strand Board
P5	Pacific five (Chile, Australia, USA, Singapore and New Zealand)
TNC	Trans National Cooperation
TSM	Timber Supply Model
UN	United Nations
UN-ECE	UN Economic Commission for Europe
USA	United States of America
WTO	World Trade Organization

Introduction

This paper is the final thesis for the Master of Science program European Forestry. The paper is written in collaboration with the Forest product and Market group of the Swedish Agricultural University (SLU) in Uppsala. It includes an analysis of forest markets and international trade of forest products. It provides the reader with a European perspective on trade flows and trends in the field of forestry, considering the growing industry in the southern hemisphere and its effect on the practices in Europe. The report consists of theoretical research, data analysis on forests and forest products and qualitative discussions which leaves the chance for the reader to come up with their own conclusions. In the broader context of European forestry it is meant as an eye opener for researchers and students, providing a clear example of the possibilities of international forestry research. Governmental and independent actors, business and non profit organizations are passing the review, giving a complete view of the situation in the global forest sector.

The European forest sector is undergoing a phase of changes. First is the success of the European Union to liberalize national based economies into a larger economic network. This network is a stronger actor in the world trade and extensive collaboration of the EU member countries results in a broader production and consumption base. Especially the enlargement of the EU with ten member states has far going consequences for the European forest sector. The enlargement process will lead to a substantial expansion of the EU forest sector. In the EU of 25 countries, the total forest area will grow by around 20% and the number of forest holdings by 25%. A large potential for employment in the forest sector, an increased self-reliance for forest products and a large increase in protected forest areas are the most important consequences. (European Commission, 2003) Research on the development of European forests tells us that the European forest is growing fast. Increased increments of trees, supposedly caused by climatic change, have been reported in national inventories. (Gold et al., 2003) The agricultural lands are also on the retreat, leaving more space for forest development. Abandoned fields stock naturally with forest within few years and this causes an increase in forest area in national inventories. (Päivinen et al., 2001)

The characteristics of the sawmilling industry in Europe are changing, as it is undergoing a transformation we can see in other industries as well. The effect of globalization on the industry is notable in the intensification of outputs and the rise in international trade. Globalization is the trend of major financial markets across the world becoming more interlinked as a result of technological innovations in communications, cross-border investment, and global trading. The influence of big producers outside Europe on the 'domestic' European market is becoming larger. More evident is the competition when discussing the expansion of the European exports to other world regions. (Pelkonen et al., 1999) Big producing countries are being analyzed in this study, focusing on the Monterey pine (*Pinus Radiata*) plantations in the southern hemisphere. Countries heavily relying on a national economic basis, on their wood products output, will form a grand opposition to European export regimes. Worldwide market access and better possibilities to trade and transport on a global level, requires from the side of forest industry companies a big effort to play along in the negotiations. (Inter-) National Legislation, collaboration across continents and the World Trade Organization are subjects which will pass the revue. The growing capacity of Southern Hemisphere countries with respect to the export of wood products obtained from the plantations of their protagonist tree specie *Pinus Radiata*, is the main subject from which is derived the problem definition.

To be able to predict the way European sawmilling industry will develop in the future in a global framework we have to monitor the ongoing trends in Europe itself, like the EU integration, larger supply of raw material and the effects of globalization, there are part of the way the European sawmilling industry will be influenced. The effect of large competing industries outside Europe on the European sawmill status is the main subject of study. The globalization effects can have a large impact on how this competition will develop. Different conditions in which the industries developed over time determine the success in the future. European woodworking has a larger historical past but is due to this old fashioned in terms of innovation and change, compared to its competitors in the southern hemisphere. Sustainability of the woodworking industry inside Europe is needed for the sake of

employment in the sector, self sufficiency of the European demand for wood products and the continuance of the sector ensures the reducing environmental impact of European consumers on the world resources.

The objective for this thesis is to give a descriptive view on the processes which are underlying international trade, define trends and discuss the competition which arise in the global wood sector. Europe and the 'southern hemisphere countries' are the frame in which this discussion takes place. The thesis will come forward as analyses of trade flows and will try to construct a better image of the global trade in wood resources and try to define the actors and driving forces behind it. It tries to give an answer to the question: What will be the effect of these southern industries on the 'domestic' European industry?

Hypotheses

The European sawmill industry will discover more competition from the growing industry in the southern hemisphere. The growing forest production and industry in the southern hemisphere provides a potential threat to established companies. This is due to the fact that the consumption markets are shared. The establishment of the industry in the wood producing countries can harm the status of the sawmill industry in Europe. The cheap production and access to already opened markets for Monterey pine products, offers opportunities for investors. When considering the distance to the consuming market and the accompanying transport costs, the investors will more likely want to invest in the growing industry in the southern hemisphere then in the European. Further more the following statements are researched:

I. Consuming markets for sawnwood in Europe will not sustain the expansion of sawmilling industries. Will the prospected enlargement take effect; the reliance on consuming markets outside Europe will become larger.
II. As WTO barriers will be with laid by big forest actors and the ongoing establishments of free trade pacts, the possibilities become viable for producers to export their processed products on a larger scale. The import of wood products from the southern hemisphere by North America, Asia and certain markets in Europe will have a larger share in the consumption.
III. Wood quality will be the determining factor in the market competition. Not only quality of the physical product but also the quality of the production method and quality of service to the customer. Marketing of products as 'ecological' is in the European case applicable; raw materials from European origin have the asset of being produced with sustainable forest management. Aiming to exploit this asset by means of giving high standards to the supplying forests and certify them as such. This will have to go a step further than certifying production chains, which is common everywhere.
IV. Domestic wood supply will be more and more substituted for imported wood. The trend towards larger corporate units through international mergers is likely to make forest product companies globalize their wood procurement strategies as well.

Methods & assumptions

This Master thesis is a review on existing sources of information about forestry issues in Europe. The Forest Sector Outlook Study conducted by UN-ECE and FAO, is the basis of the problem definition. Statistical data are obtained from FAO, to research further the prospects of the European sawmill industry in relation with the production of sawnwood in the southern hemisphere. Assuming country data in the Forest Resource Assessment (FRA) are correct. Reason for suspicion of malicious data is concern that countries do not pass on the correct data to the FAO. This assessment is partly made with the use of satellite photographs, so the most data is based on real observations, not on inquiries. To distinguish between planted and natural forest, national input is needed. Here lies also the greatest constraint. The comparison between national inventories, which are not based on the same definitions, gives inaccurate outcomes and the ambiguity of the term plantation forest leaves room for a wide variance in the data supplied. Still, a grand effort is made to come up with the best estimates possible and using the compromises can give an accurate view on what is going on a global level, concerning forest plantations.

Further on the statistical data of FAO-Stat forestry is analyzed, this data base provides a complete view on national and bilateral trade statistics. Analyzing the literature about global wood markets and combining this with knowledge of developments and trends in the forest sector are the basis of the discussion and conclusion. Econometric models and their outcomes give an idea of future market developments and trade prospects. In these models supply and demand are tested to capture the effect of global trends on the trade in timber, including the dynamics of prices, demand and supply, models are used to give a quantitative image of trends and to be able to prospect the trade based on statistical inputs. Examples of these models are the Global Trade Model (GTM), Timber Supply Model (TSM) and European Forest Information Scenario Model (EFISCEN). Outcomes of these models are used to create perspectives for the sawmilling industry. Clear from these models is that domestic demand is growing too slow to support the growing sawmill industry.

The structure of this study is to directly engage the obtained results with the discussion. This provides the reader with an immediate review on the figures and literature. The reason for choosing an approach like this is that the information is easier accessed and better distinction can be made between the playing issues. Giving a world-wide view on matters, the report is trying to highlight certain aspects which are relevant to the problem, finding distinctive patterns in the assessment of the complex situation of the world's resources and the utilization of them.

Results & discussion

Global forest resources

The forest areas in the world are in steady decline. Despite growing environmental awareness and conservation efforts, the decline in forest area has continued. It is estimated that between 1980 and 1995 approximately 180 million ha of forests were lost or converted to other uses. This represents an area larger than Mexico or Indonesia (FAO, 1997). The current net annual deforestation rate (natural forests loss offset by planted forests gain) is estimated at 9 million ha annually (FAO, 2001a). The total loss of the world's natural forests, which comprises deforestation and conversion to planted forests, is larger and estimated at approximately 16 million ha. Most natural forests, 94%, are lost in the tropics. (Syriah et al., 2005)

Region	Land area ($x\ 10^3$)	Forest area ($x\ 10^3$)	Natural forest area ($x\ 10^3$)	Planted forest area ($x\ 10^3$)	Population ($x10^6$)
Africa	2 978 394	649 866	645 829	4 037	767
Asia	3 084 746	547 793	482 364	65 429	3 634
Oceania	849 096	197 623	194 775	2 848	30
Europe (Incl. Russia)	2 259 957	1 039 251	943 160	96 091	729
North America	1 837 992	470 564	445 812	24 752	307
Central America	298 974	78 740	78 092	648	171
South America	1 754 741	885 618	875 163	10 455	341
World (total)	13 063 900	389 455	3 665 195	204 260	5 979

Table 1: Statistical data on the world's forest resources, divided into 7 main regions. Population data are also given. (FAO, 2001 and Syriah et al., 2005)

According to the global forest resource assessment (FRA) of the Food and Agriculture Organization (FAO), and an update made by Syriah et al., there exist 204 million ha of planted forests by 2002 (*Table 1*). This is the area on which forests composed of exotic or native species were established on forest and non-forest lands by direct seeding or planting primarily for industrial wood production. Natural forests are defined as forests undisturbed by human management or forests composed of native species that are managed and utilized but regenerated naturally following their harvest. Natural forest cover was calculated as the difference between the total forest cover and planted forest cover. The vast majority of forests, approximately 3.7 billion ha or 95% of the total forest cover, are of natural origin.

Timber is the major market-based forest product and a primary reason for actively managing forests. The total standing wood volume of the world's forests is estimated at 386 billion m^3. Europe (including the Russian Federation) and South America lead the world with the largest forest inventories, 116 and 111 billion m^3, respectively. The world's forests produce approximately 1.6 billion m^3 of industrial roundwood and 1.8 billion m^3 of fuel wood and charcoal annually (FAO, 2002). A comparison of harvest and forest inventory data indicates that nearly 1% of the world's total standing volume is harvested annually. The contribution of industrial roundwood production and manufacturing to the global economy was estimated at $400 billion in the early 1990s, or 2% of global GDP (WRI, 2000).

Industrial wood plantations represent the minimum area that is actually subject to traditional or modern forest harvesting regulation techniques. Probably much of the other planted stands in the

world, many of which are in Europe, are also managed actively and subject to sustained timber yield regulation and management. The 204 million ha of planted stands (5%) are probably the most actively managed forests in the world. The remaining 95% of the world's forests are managed in natural stands, left to grow naturally, or are reserved from wood production entirely. Comprehensive forest inventory information about national forest plantation resources is generally scarce at the global level. There are several reasons for this, not least the difficulties in differentiating between natural forests and forest plantations. Forest plantation is an ambiguous term and if definitions are given, it is not applicable everywhere. (Solberg et al, 1996) A forest plantation will generally be defined according to the extent of human intervention in the forest's establishment and management. Forest stands established by planting or seeding in the process of afforestation or reforestation. They are either of introduced species, or intensively managed stands of indigenous species, which meet all the following criteria: one or two species at planting, even age class, regular spacing. (Brown, 2000). In many instances, because there is an extensive range of silvicultural practices applied in intensive forest management, the difference between a semi-natural forest and forest plantation is essentially arbitrary.

Plantation forests provide a way to reduce the impact on more natural forests, providing a stable source of roundwood for industrial purposes. The question as to what role forest plantations might play in meeting future wood demands is linked to past, current and future patterns in forest plantation establishment. The area of trees already in the ground will determine production in the immediate future. Future planting is dependent on available resources, perceived rates of return, successes of previous planting programs and perceptions of future supply-demand imbalances. (Brown, 2000) These factors are investigated and compares for five countries in the southern hemisphere, which are using the Monterey pine (*Pinus radiata*) extensively in their planting programs. These pine plantations have the potential of becoming a big player in the global wood market.

European market expansion

The European sawmilling industry has the potential to be growing quickly in the coming decades. The integration of Western and Eastern Europe is an exchange of respectively technology and resources. Combining the efforts of both regions will lead to a steady growth of the sector. Market expansion, as projected in the European forest sector outlook study (UN, 2005), is connected to the increasing availability of resources. Increasing annual increments, positively shifting age-class distribution and forest area expansion contribute to the fact that harvesting rates can increase. The results of the study conducted by Gold et al. (2004) show that forest resources have expanded in terms of forest area, growing stock and net annual increment over the last half century. The analysis indicated that less wood has been harvested than grown and that there is a physical potential to increase wood supply from European forests. The cost for industries is lower, due to lower roundwood prices. (Solberg, 2003) The demand for forest products will not rise as vigorously, so an overproduction of processed wood products is expected. Regional overcapacity drives the sawmilling industry to seek out new markets. The market availability depends on the competition of domestic production and import from other regions.

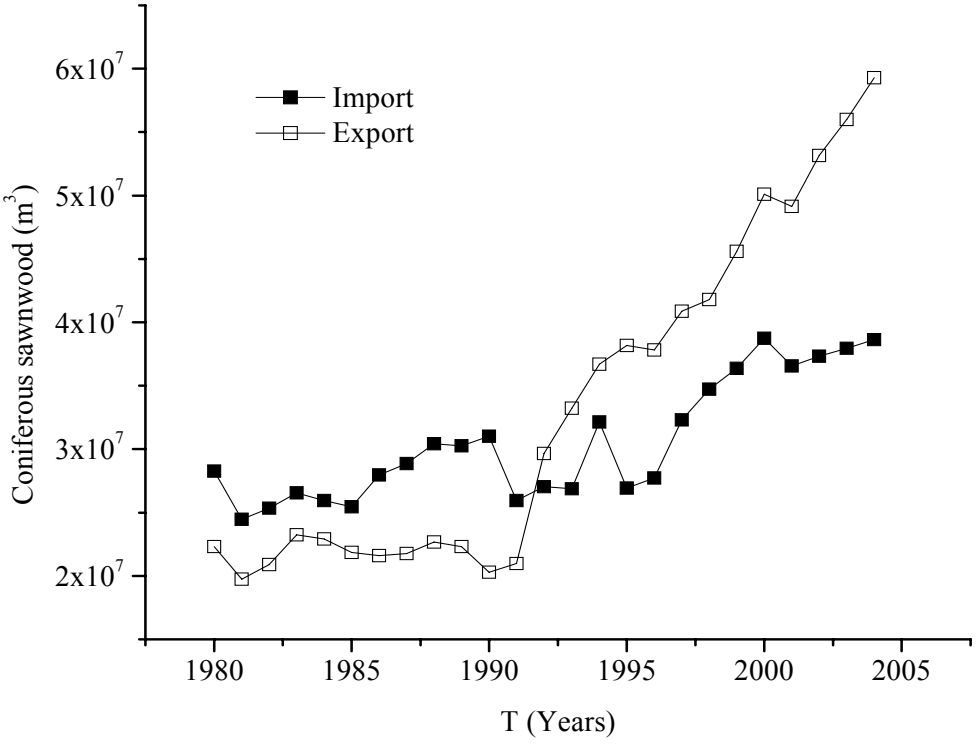

Figure 1: European trade of coniferous sawnwood to non European countries. (FAOSTAT data, 2005)

As shown in *Figure 1*, Europe has become a net exporter of coniferous sawnwood to the world. For other forest products (e.g. sawn hardwood) this is also the trend, but as coniferous sawnwood accounts for over 75% the international trade, this figure provides an accurate image of the trend. Around 1992 the export spree of forest products began and is continuing to rise in the same trend. CEI-Bois' Roadmap for the woodworking industries (Timwood AB, 2004) also reports this move with additional comments on the intercontinental trade, namely the interconnectivity of this trend with the flat demand in Europe. Export continuation depends on the competitiveness of European wood and the collaboration with the big markets such as Japan and USA. Diversification of export products and lower production costs are essential in the competitiveness of the sector with other wood exporting regions.

Sawnwood production in Europe is expected to continue to increase reaching nearly 105 million m^3 in 2010. (Pöyry, 2004) Both Timwood (1998) and Trømborg *et al*. (2000) expect a dramatic growth in European sawnwood production between 1997 and 2010. The increase is assessed to be in the range of 11–20 million m3 due to increased availability of sawlogs. However, the overall annual growth is estimated to be slower than the last decade due to the slow growth of consumption in Western Europe and markets overseas. An increase is expected in Eastern Europe as Scandinavian firms import more and profiting domestic industries with low production costs. A significant growth in the demand for wood products in Europe is not likely to occur, despite the development in Eastern Europe.

The convergence of Eastern and Western Europe is increasing the potential production of the European sawmill industry. The Eastern European forests have a larger standing volume, with harvest rates even lower then in Western Europe. The lower GDP in impedes lower salaries for the work force and combined with the increased opportunity of foreign investments, the industry will grow. Projections for the future, as laid out in the European forest sector outlook (UN, 2005), indicate that the potential growth of the sawmill industry in Europe will especially take place in the developing industries of Eastern Europe. *Figure 2* displays the projected growth in three European regions: EU/EFTA (Western Europe), CEEC (Prior Iron Curtain countries and the Baltic States) and CIS (Former European USSR). The growth of the production is expressed in millions of cubic meters and in percentages over a twenty year period.

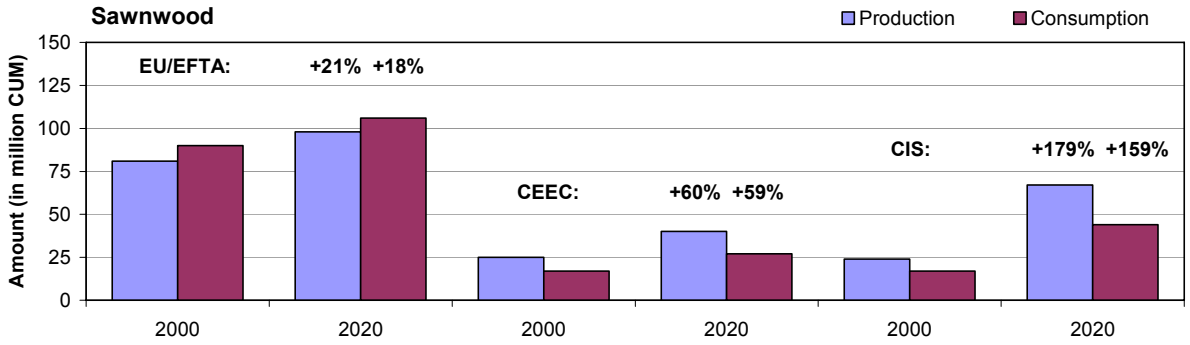

Figure 2: Sawnwood production and consumption in Europe according to the regional division made in the European forest sector outlook study. These figures are for sawnwood only, but in general the trends are the same for all wood products. (Whiteman, 2004)

From this figure we can derive a few observations. First, the growth of production and consumption levels will be far higher in the eastern regions than in the EFTA countries. In the CIS region we can expect an increase of 79 % of sawnwood production in 2020, compared to the production level in the year 2000. The establishment of a modern sawmill industry drives this change. Developing economies and the investment opportunities increase as the convergence evolves. Second, the Eastern regions are net producers while EFTA countries depend for an amount of sawnwood on imports. The imports of raw materials from East to West is already a common practice, but will diminish in the coming decades due to the slightly better self- providing prospects of the EFTA market.

The expansion of the European Union with the 10 new members, in the UN study taken into the CEEC region, is an important fact to take into consideration when discussing the European market expansion. As laid out in *table 2*, the relative area of forest added to the EU with this expansion is not equivalent to the addition to the existing standing volume. This could be an indication of the difference in forest usage and ownership. Eastern European forestry is more dependent on the government and is not so much commercialized as the Western European forestry, and the forest therefore is generally more mature, due to the low harvest rates. Mostly this has to do with the lower capacity of the forest sector.

General statistics on integration of European forests				
	Forest area ($x10^3$ ha)	% of national territory	Plantation area ($x10^3$ ha)	Existing standing volume ($x10^6$ m^3)
EU-15	115 685	36.9	7 480	15 003
New 10	23 952	33.3	923	5 002
EU-25	139 637	36.2	8 403	20 005

Table 2: Figures concerning the EU expansion with 10 new members. (FAO, 2005)

Sawnwood in the new European Union (m^3)					
	Production	Imports	Exports	Apparent Consumption	Self-sufficiency
EU-15	79 662 154	39 168 464	34 863 531	83 967 087	94.9%
New 10	15 696 663	3 136 840	8 778 806	10 054 697	156.1%
EU-25	95 358 817	42 305 304	43 642 337	94 021 784	101.4%

Table 3: Expansion of the EU concerning the trade in sawnwood products. Consumption rates are derived from the production and trade figures. Stocking of products is not included, so apparent consumption rates are higher estimations than the real consumption rates. (UNECE/FAO, 2005)

Looking at the figures in *table 3*, we can see a higher self-sufficiency of the demand in Europe of sawnwood products. As laid out in the 'CEI-Bois Roadmap to 2010', (Timwood AB, 2004) the European Union has changed from a net importer to a net exporter. The woodworking industries have undergone big changes in the last few decades. The supply of raw material has risen, due to higher domestic availability and international trade. Imports of industrial roundwood has broadened and the Also the production has diversified, including growing production rates of engineered wood products such as Glulam, MDF, OSB and LVL. The industries are directed towards technological innovation, to stay ahead of industries outside Europe. To insure the continuance of export at stable incomes, continuing innovation and investments from the side of the industries is vital.

The European forest sector is expected to face increasing competition from producers outside Europe, the main competition is likely to come from the expansion of the forest sectors in countries with extensive areas of fast-growing forest plantations, mostly in the Southern hemisphere. On the other hand, the demand for sawnwood will also increase in some countries in Asia and Africa. These markets will present opportunities for export growth that are likely to be exploited by the European sawmill industry, but can expect heavy competition due to the fact that other net producing regions will also try to get a larger market share there. The opportunities for the sawnwood market are explored and put against the demand of the customers.

Coniferous sawnwood is predicted to have a great overcapacity, driving prices lower. The fragmented nature of the sawmilling industry is disadvantageous in this situation. A larger, concentrated sawmill can produce higher capacities and thus produce lower priced products. The study conducted by Nilsson (2001) also concludes that larger sawmills have the best chance of survival. A clear example of this process is the Austrian sawmill situation in *figure3*.

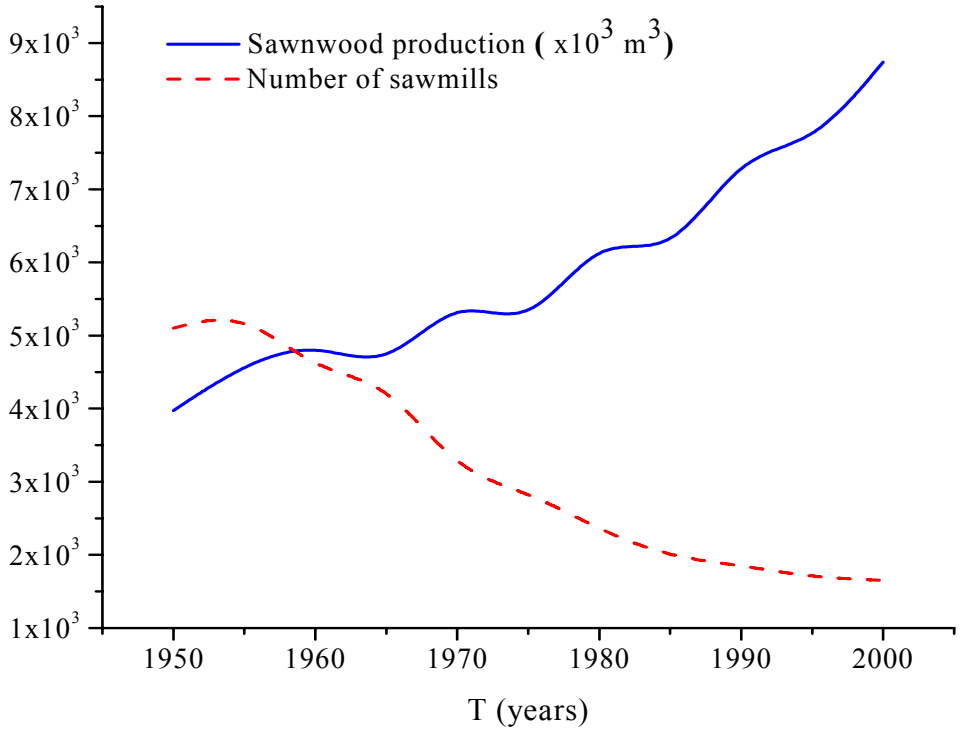

Figure 3: Number of sawmills and production over time in Austria. (Fachverband der Holzindustrie Österreichs, in: Nilsson, 2001)

Analyzing the data shows us that the downward trend in the sawmill population is negatively correlated (R = -0.871) with the sawnwood production. Interesting would be to check whether the price influence or the availability of roundwood completes the correlation sequence. If this trend is proceeding it will have several impacts on the timber trade. Domestic production will be more and more substituted by imports, giving imports a larger share of the consumption pattern. Concentration of sawmills will take place, with mills that are bigger and produce more sawnwood. International trade will be the focus of these mills with intensified efforts in marketing and product development.

Large differences reside within the European wood working industries with regards to its structure and position. Overall, the fragmented industry and distribution structures in most wood industries and markets is weakening the supply chain efficiency, industry competitiveness and as a consequence the consumption of wood products. (Pöyry, 2004) To gain efficiency through scale enlargement in modern and large facilities, horizontal and vertical integration as well as "clustering" and "mega-sites" involving a range of related industries and manufacturing processes. Merging sawnmills and paper plants is becoming a more common approach in seeking the balance between production cost and sales. The industries are increasingly operating internationally, investments, processing and exports determine the success of a company. The increased sector collaboration and clustering, is apparently the way to make profit and companies who do not follow this trend will eventually be usurped by the bigger players.

The substitution of domestic supply to imported industrial wood supply is becoming more evident. Studies conducted by Uusivuori and Kuluvainen (2001) concludes that the substitution of domestically produced wood for imported industrial roundwood is becoming more normal as price fluctuations in the domestic production drives the industries to seek out raw material on an international level. This is parallel to the findings of Sedjo and Lyon (1990) of international trade compensating for national conservation policies. The forest protection of the northwestern United States led, according to this study, to an increased logging in other parts of the world through international trade in wood products. In the large countries that are also large consumers of industrial wood (North America and Europe) there is a growing tendency to place more forest under protection. As more forest will be taken out of commercial use and roundwood production in these regions imported wood will serve as a substitute

for domestically produced wood, and international trade in industrial roundwood will continue to grow. The increased share of imported wood in the consumption provides more space for the multifunctional character of forests. Conservation practices as well as biomass energy production are thus becoming more viable in industrialized countries. Over the last few years there has been increasing concern expressed about the economic viability of forest management in Europe. Recent downward trends in prices and the generally low harvesting intensities in much of Europe indicate that the income from forest operations is declining at the same time that costs may be rising. Upward pressure on costs may come from rising labor costs, new developments such as forest certification and requirements to pursue non-wood management objectives.

The strong differentiation and fragmentation of the ownership of forest land in a lot of European countries means that often the forest is not profitable to do management activities in. Small forest owners often have more cost than profit and have to sustain their forest land artificially, sell out harvests and try to break even with their budget by applying for subsidies. Good examples are in the Netherlands, where owners in the lower area classes (until 50 ha.) are gravely exceeding the budget, while owners over 50 ha break even in most cases. (LEI, 2003) This trend is visible in more countries and the underlying reasons are that the owner's cost on the forest land are high, due to high insurance and labor costs. Management activities are less favorable to apply and therefore the extraction and the quality of timber will be less. This situation of the fragmentation of ownership is inhibiting the supply to growing industries. The merging that occurs in the woodworking sector is not reflected in the supply chain

Growing industry in the southern hemisphere

The plantation forestry in Southern hemisphere countries is specialized in Monterey Pine (*Pinus Radiata*). Monterey Pine is an endemic tree species in the Mediterranean climate of California, USA and Mexico. The tree is a disturbance related regenerator (fire) and is used to grow in dense conditions. In the past it is broadly introduced in various countries as a fast growing, high quality wood producing tree. Due to it's characteristics of a fire regenerator the tree grows like a pioneer, fast and in dense stands. In rotations of 25 to 30 years the trees mature and are harvestable. In well groomed forests the quality of the wood is outstanding, pruning and thinning provide stain and knot free wood, which provides a market niche for 'clean' Monterey pine products. Genetic improvement and favorable conditions has led the introduced species in New Zealand and Chile to be more productive than the endemic Californian Monterey pine. Monterey pine products have become an important player in the wood and pulp market. The tree is both harvested for sawlogs and wood chips as well as for pulp and other value added products. Mayor importing countries of Monterey pine products are situated in North America and Asia, there where Europe is trying to get a market share.

Division of land area to forest plantation (million m^3)					
	Chile	Argentina	Australia	New Zealand	South Africa
Land area	74.9	278.4	761.8	26.8	122.1
forest area	15.5	34.6	164.4	7.9	8.9
natural forest area	13.4	33.2	162.5	6.2	7.4
plantation forest area	2.0	1.4	1.7	1.8	1.6
Monterey pine (*Pinus Radiata*)	1.44	0.76	0.74	1.63	0.82
other (mainly *Eucalyptus spp*.)	0.56	0.64	0.95	0.17	0.7

Table 4: General data about the relative amount of Monterey pine plantations in the countries. (FAO,2001)

From *table 4* it becomes clear that from the countries analyzed the mayor Monterey pine planters are Chile and New Zealand. Respectively the species is planted in 72 and 91 % of the cases. These countries have different backgrounds concerning the plantation forestry schemes, but can ecologically be seen as comparable. The ratio of planted forest against natural forests is quite high, further growth of this ratio, with the development of industries and the accompanying establishment of more plantations, will put more pressure on the ecological features of the countries.

The establishment of forest plantations, especially in the southern hemisphere, is growing with great vigor. The underlying reasons for this growth can become clear on a national basis. Changes in the area of forest plantations vary between years and between countries. This variation is caused by a number of factors: government financial input, general economic conditions, incentives offered to the private-sector to establish forest plantations, perceptions of the profitability of forest plantation investments and levels of promotional activities. (Sedjo and Lyon, 1990) In the long-run it would be expected that the absolute area of new planting will decline as countries and investors reach a saturation point when the marginal benefits of establishing forest plantations equals the marginal costs.

In the short-run however, changes in planting rates may occur as a result of structural changes in the economic environment or investor perceptions. For example, in New Zealand, annual new planting for the period 1993-1997 averaged 75,000 hectares compared with 23,000 hectares in the previous five-year period. (IFSOS, 2004) This occurred largely because of changes in the perceived value of forest plantations. The trees planted in the high establishment period, are now approximately 8 to 13 years of age, in two decades more a great availability of raw material is expected. Similarly, changes in social or environmental factors may generate short-run changes in forest plantation establishment activities

or may move the rate of new planting onto a different trend line. For example, if forest plantations become a viable option for carbon sequestration projects, there may be an upward shift in annual rates of new planting in a number of countries. In *table 5* the individual national planting rates of five countries in the southern hemisphere over a ten year period are shown. Also displayed are the average deforestation rates, to give an idea of the change in land use.

Average rates of change over a ten year period (1990-2000)					
	Chile	Argentina	Australia	New Zealand	South Africa
Growth plantations (ha/year)	85 000	40 000	35 000	82 000	12 000
deforestation (ha/year)	105 000	325 000	317 000	43 000	20 000
Balance	-20 000	-285 000	-282 000	39 000	-8 000

Table 5: Rates of change (Global forest resource assessment; FAO, 2000) Figures include harvesting and reforestation data.

The role of plantations in this decline is two sided, the substitution of natural forest for easier manageable and more profitable planted forest of exotic or native species, is occurring. On the other hand plantations provide industrial wood and reduce the impact of industries on natural forest resources. The discussion between environmentalists and forest companies gives two distinct opinions in the use of forest plantations. The environmentalist opinion states that a monoculture forest is hardly to be called an ecological forest. It is rather an agricultural system, planted for the growth of wood, where the biodiversity and inter-specific relations are restricted. It does not fulfill the ecological and social functions of a native forest. (Catalán, 1999) While forest companies and associated researchers state that there is no substantial scientific evidence that these monocultures do harm to the environment, negative impacts on ecological and social values are clearly visible.

On the other hand, forest plantations do provide a source of wood for a growing industry, without which the native forest would suffer more impact. The supply of raw materials to the growing industries is analyzed by Sedjo and Lyon (1990), offering world wide outlooks for the trade in wood products with an econometric model for the demand supply elasticity, assuming stable prices. The report also discusses the rate of deforestation of natural forests and the balance with the establishment of plantation forests to supply wood industries. Deforestation rates are in the most cases larger then the plantation establishment. In this case it shows us that the substitution of natural forests for plantations is essentially not the main cause of deforestation. Clearing of forest land occurs mainly because of the establishment of meadows for cattle or crops.

Country	Import		Export		Production	Consumption
	Quantity m^3	$US (x1000)	Quantity m^3	$US (x1000)	Quantity m^3	Quantity m^3
Argentina	311 600	94 517	193 900	53 995	2 009 000	2 126 700
Chile	0	0	1 604 000	306 355	17 853 000	16 249 000
Australia	1 011 100	354 270	259 100	70 893	7 969 000	8 721 000
New Zealand	50 000	32 445	1 752 000	432 275	4 363 000	2 661 000
South Africa	452 800	153 254	125 400	32 142	14 334 000	14 661 400

Table 6: Solid wood trade and domestic consumption-production. (FAO,2001)

Chile and New Zealand also are the biggest exporters in solid wood products, as shown in *table 6,* connected directly to the large amount of plantations the countries possess. Further research on these two biggest players, can give us an overall view on the development of trade in Monterey pine products. In *figure 4*, the statistic means for production, consumption, import and export of coniferous sawnwood over a ten year period are displayed. In Australia and South Africa the consumption is higher than annual production and it becomes clear from the export figures that Chile and New Zealand have such an excess of production that imports are not needed.

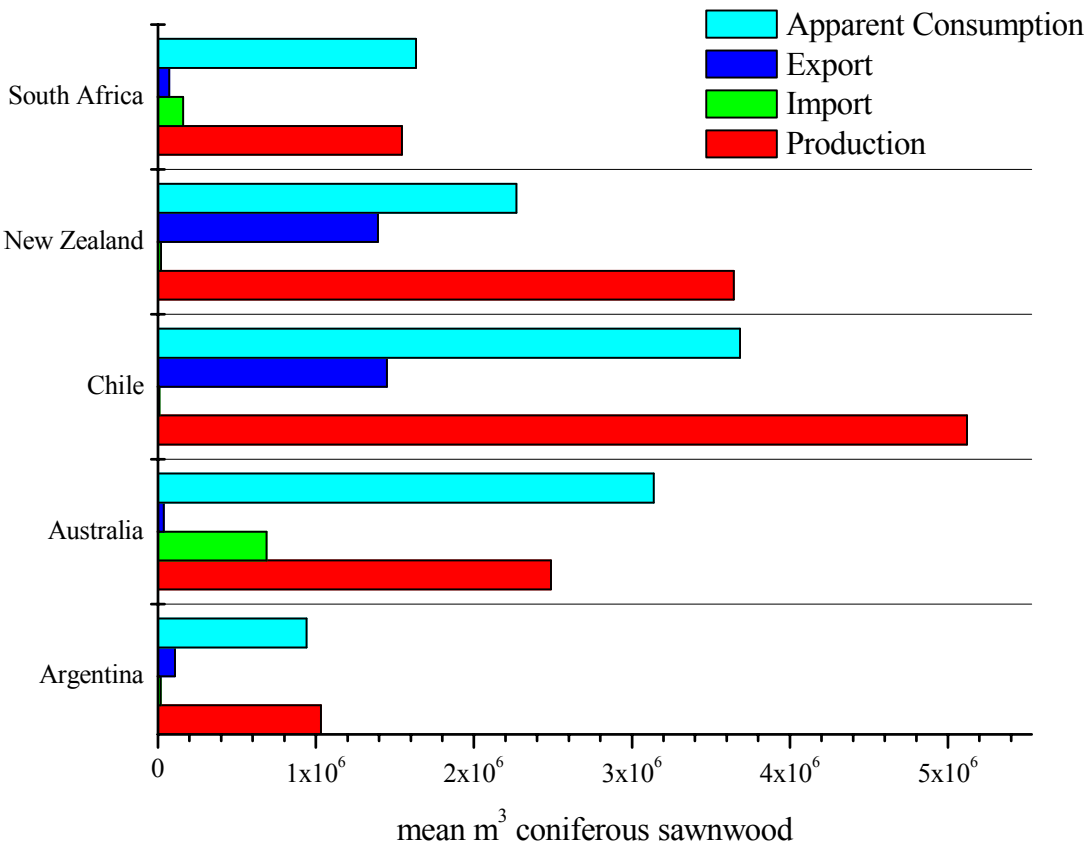

Figure 4: Mean amount of coniferous sawnwood produced, imported, exported and apparently consumed in the five southern hemisphere countries per year, over a ten year period (1995-2004) (FAOSTAT, 2005)

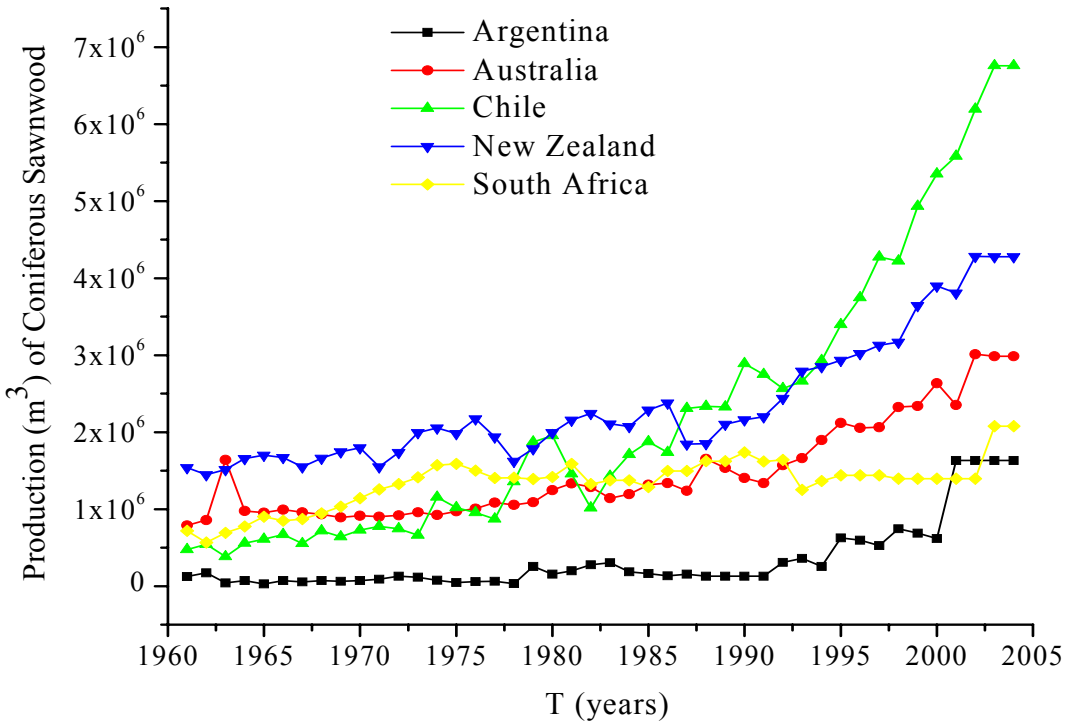

Figure 5: Rising sawnwood production in the countries analyzed. Growing sawmill industries indicate ongoing rise in the coming years. (FAOSTAT data, 2005)

Looking at *Figure 5*, we can conclude that in all analyzed countries the production of coniferous sawnwood has risen fast since the early nineties/ late eighties. We can observe with this figure that the growth of the processing forest industry, driven by big supply and growing investments. The establishment of forest plantations has this growth as a direct consequence. Prospect for the coming years is a further growth and diversification of the industry. In South Africa the growth has not been so evident, this is due to the plantations becoming less popular because the accompanying drought in the regions of mayor plantings. Hardwoods, like *Eucalyptus spp.* will take over the sector here, driving it toward more paper and pulp based.

The establishment of plantations also delivers a chance for the wood processing industry to establish itself near to the raw materials. Establishing sawmills have different orientated investors, especially in South America, foreign (Japan, USA) investments are common. These facts are changing, with the establishment of domestic industries stimulated by their governments. Chile and New Zealand encounter the biggest growth in sawnwood production (*figure 5*), considering this growth and diversification of the products, exports of only raw materials to other processing countries will shift to processed products exports. The easy character of Monterey pine plantations in these countries make production cheaper as European. According to the World Resources Institute (WRI) production costs for industrial roundwood in Europe is three times as high as in Chile or New Zealand. This advantage is until now not wholly exploited, as the industries are in development.

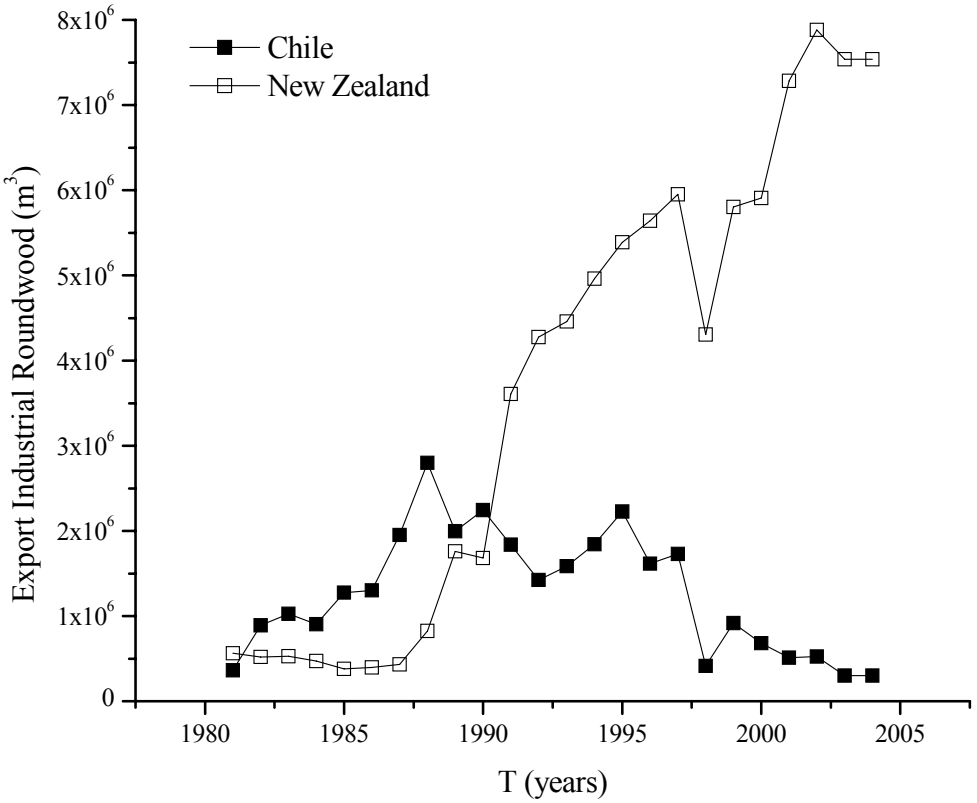

Figure 6: Industrial roundwood export in square meters over a period of 25 years. Source: FAOSTAT, 2005

For New Zealand the main export product is unprocessed logs to industries elsewhere. 60 % of the export volume is industrial roundwood. The development of roundwood production over time is laid out in *figure 6*. Nowadays, New Zealand exports around 8 million m^3 of unprocessed logs and poles of which half goes to South Korea. Striking is the different strategies that the two countries maintain. Chile has undergone a steady decrease in industrial roundwood exports since the late eighties. This apparently is due to the consumption of roundwood by Chilean industries. Export in this country is thus mainly based on processed products, also notable in the high consumption of solid wood products, mainly by the Chilean industry (*Table 6, figure 4*). New Zealand exports more raw materials to foreign industries, than they consume themselves. Income differences are based hereupon.

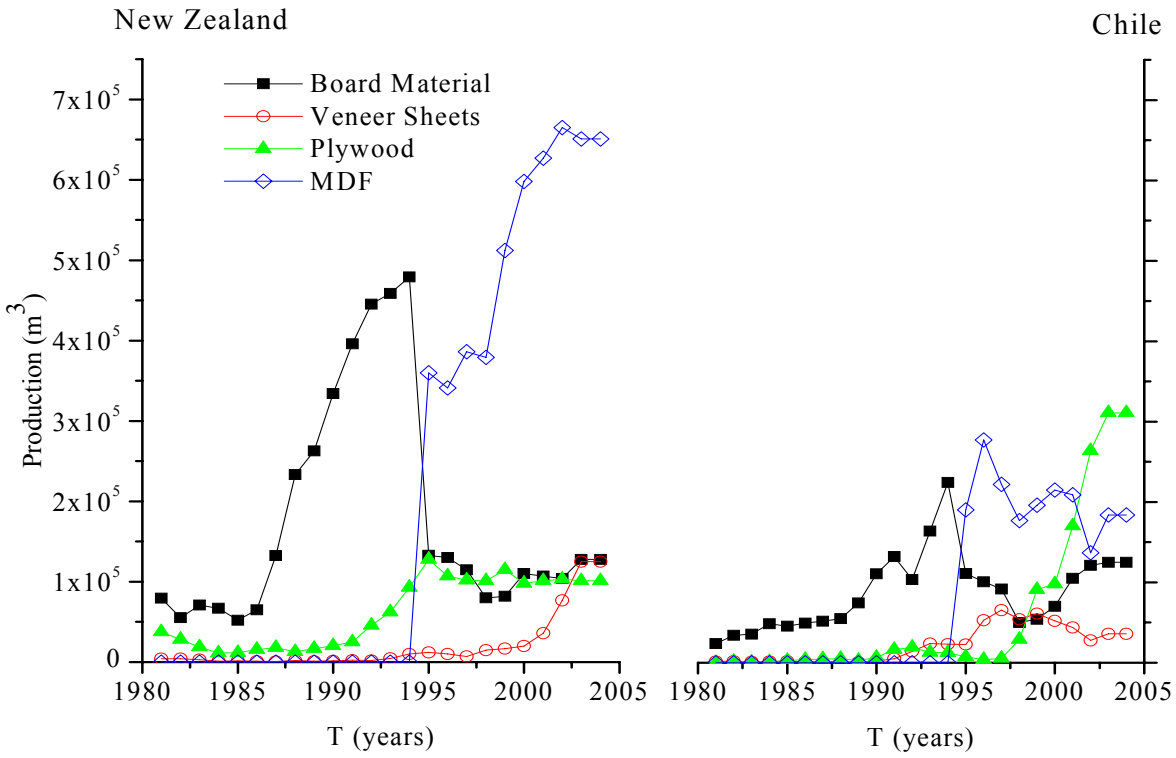

Figure 7: The production rates of value added products in New Zealand and Chile. (FAOSTAT, 2005)

The consequences of these growing industries, with the raw materials close at hand and in the southern hemisphere. The industry has access to large and cheap resource base, and with few incentives added, the industry can develop. The stable nature of this resource base, as a supplier of roundwood that is, offers a fertile soil to make investments. On the previous page we were discussing the difference between Chile and New Zealand on the basis of the figures on industrial roundwood exportation and the trade statistics on solid wood consumption, noting that the New Zealand's industries consumed less. As shown in *figure 7*, the growing production of value added products is displayed. New Zealand is in this case more specialized in engineered products as the Chilean industry. The production of especially MDF is in New Zealand much more developed. Around 1995 the statistics of both countries show a turning point between the production of MDF and other board material. As MDF was previous to 1995 not produced, the assumption can be made that MDF was previously incorporated into board material production. High rise in MDF production world wide, made FAO take it into a separate category.

Timber has always played a significant role in the New Zealand economy. The development of a plantation based forest industry began in earnest with the establishment of a State Forest Service in 1919. There are now 1.8 million hectares of plantation forests of which 89 percent is radiata pine (Pinus radiata). Plantations cover seven percent of New Zealand's land area and comprise 29 percent of the total forest area. Of New Zealand's major forest product export markets, Asia, Australia and the USA compromise the largest share, see also *table 7*. These economies are important markets for New Zealand forest product exports, and represent an increasing share of the value of New Zealand's forest product exports. (Turner *et al.*, 2001) The European share in the exports of sawntimber from New Zealand is meager, although in the last few years rising steadily. Sawntimber exports have indeed risen during the last few years and the establishment of contacts with consuming markets is paying off.

Export of New Zealand sawntimber in m^3					
	Asia	Europe	North America	Oceania	other
Year					
1999	632 243	2 249	348 941	387 382	3 784
2000	693 762	0	353 122	472 322	2 302
2001	740 505	706	504 918	365 928	2 077
2002	848 890	1 974	548 089	432 898	2 968
2003	792 158	3 450	476 903	431 854	3 623
2004	883 254	9 858	430 801	444 851	4 303

Table 7: The Export of sawnwood to regions. (INFOS database, 2005)

The forest sector development in Chile is propagated by the establishment of Monterey pine plantation from the 1960's onward. The industrial consumption of wood has increased from this time on from 3.7 million m^3 until 22.1 million m^3 in 2003. The observed growth is due to the efforts made on national level to plant the pine species until the 1990's. 80 % of the established plantations are Monterey pine. After this time Eucalyptus became more frequently planted and nowadays the share of Monterey pine plantations amounts to less than 50 %. The effectiveness of the forest plantations is shown in the decrease in the demand of native forest products. (INFOR, 2004) Still, ecological and social conditions have worsened with the establishment of the plantations. Conflict situations between local people and forest companies are not uncommon in Chile. Especially the indigenous population, and cattle holders object to the further establishment of the plantations. Drought problems, lack of fuelwood and no space for pasturing are the main reasons for objections. (Van Soest, 2004) The Chilean government is trying to compensate for the social and environmental damage of the forest plantations, by establishing communities where local people can deploy their activities. Nevertheless, forest companies have a large impact on the countryside.

Main export destinations for New Zealand forest products are displayed in *figure 7* on the next page. Overall we can say that USA, Australia and the Asian countries account for almost all the export. Only a 9 % share is paid for by other countries. Forestry has an 11% share of total export income in New Zealand. A large share of New Zealand's export is headed toward Asia; logistically Asia is the most reachable market, and except for Australia and USA, it represents the largest importing countries for New Zealand forest products. The main asset of New Zealand timber and logs is the good price-quality ratio. Also the nearness of large consuming markets next door (Australia, Asia) is favorable for New Zealand's timber industry.

The Chilean export revenues in *figure 9* have an overall better distribution of consuming markets for their exports (less dependent on a few big importers) and have a larger amount of profit in the forest sector yearly. This is mainly due to the fact that Chilean products have more value as they have undergone a value adding process. The larger scope of Chilean products has likely something to do with culture. In Europe countries such as Spain and Italy have large imports from Chile, and Mexico and South America also does not have an equal share of imports from New Zealand. Language is in these cases the main asset of the Chilean forest sector. New Zealand is also farther situated from these consumers, meaning higher transportation cost. Asia is for Chile as well as for New Zealand a large consumer. The farther distance of Chile in this respect is not an issue. Chile even consumes a bit of New Zealand's fine timber.

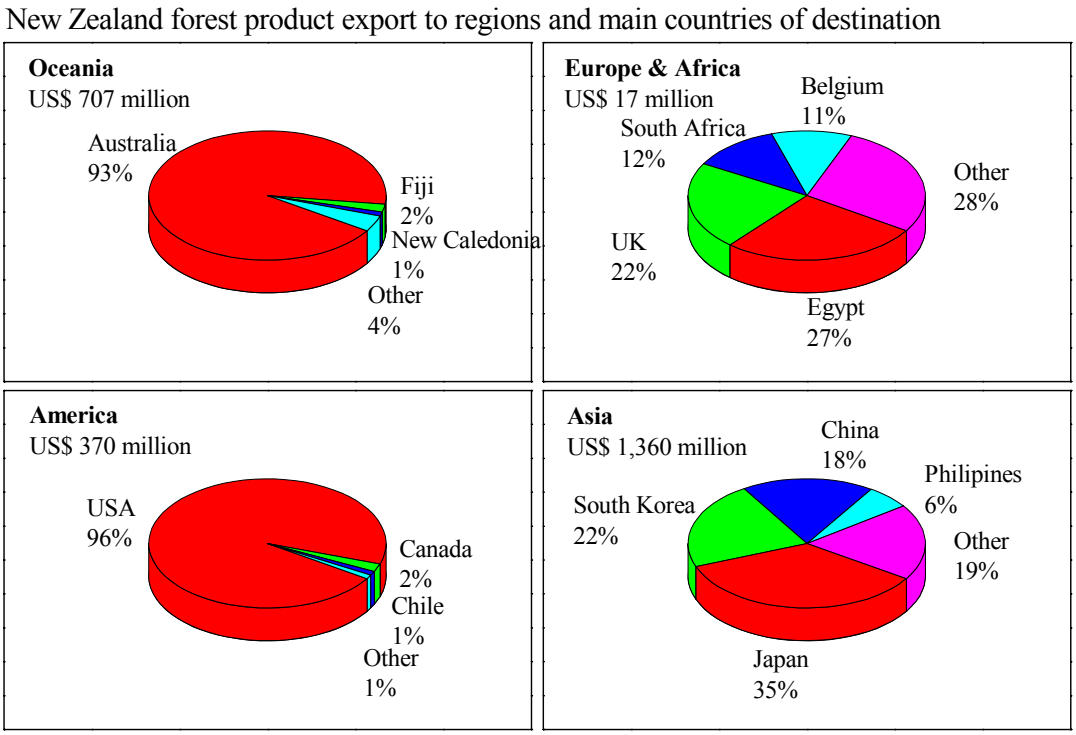

Figure 8: Exportation of New Zealand forest products to the world. (IFSOS database, 2005) Europe and Africa are merged due to their low share in the overall export income.

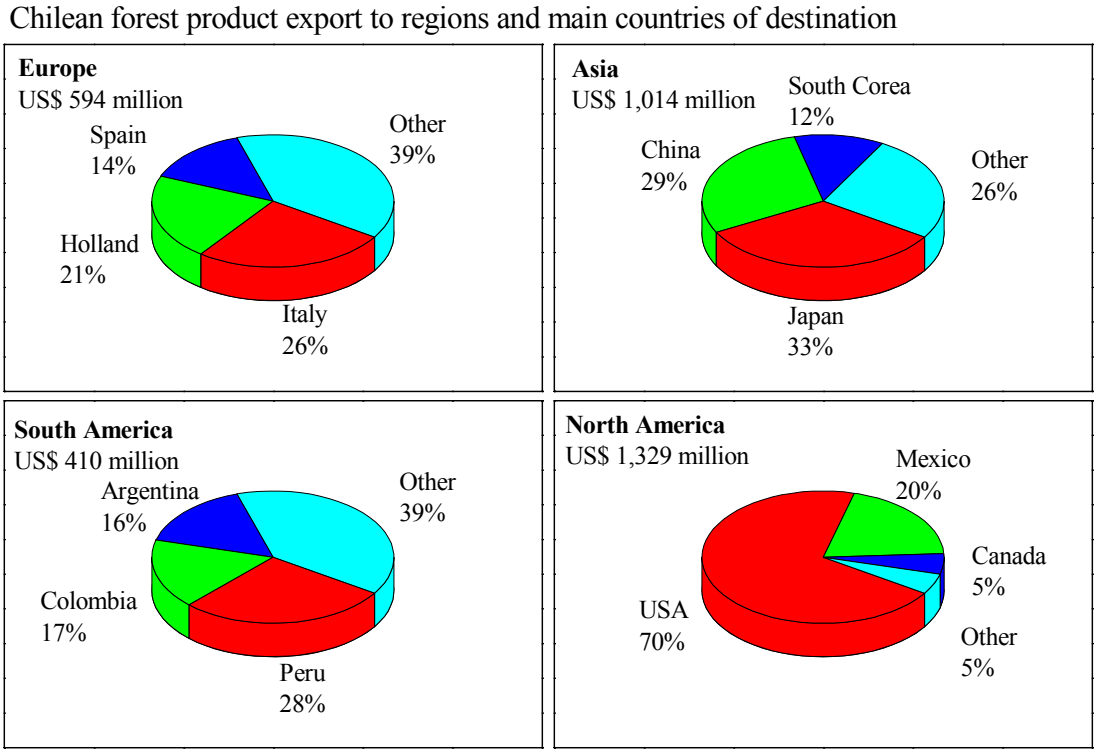

Figure 9: Exportation of Chilean forest products to the world. (INFOR, 2004) Trade to other parts of the world (Africa, Oceania) is neglectable.

Forest Models as tools to predict global demand

To capture the effect of global trends on the trade in timber, including the dynamics of prices, demand and supply, models are used to give a quantitative image of trends and to be able to prospect the trade based on statistical inputs. Examples of these models are the Global Trade Model (GTM), Timber Supply Model (TSM) and European Forest Information Scenario Model (EFISCEN). These models have had their evolution starting with the elaboration of yield models and simple growth-drain supply models, where the supply into the industry is a function of the stock of forest biomass. Later they adapted towards more complex matrix models incorporating control theory, where laws of motion, (growth and standing stock) and control variables (rotation and regeneration input) determine the outputs of the model.(Sedjo & Lyon, RFF; 1990)

The TSM is an optimal control model that projects regional supply of timber sources to global demand. The research is directed toward predicting the optimum investment levels in the plantation of production forests, with the highest rate of return. The silvicultural responses to investment inputs can be predicted by putting the cost for production, including access, logging, transport and regeneration costs, against the price equilibrium. The amount of investment needed for optimal returns is interesting for companies willing to invest in forest production. The GTM is a model for predicting the demand for forest products and is based on static econometric matrices. By looking at population and income growth it comes up with the demand for wood products considering the price elasticity and the wood conversion factors with the use of technology. The amount of wood needed for every consumption product is laid out against the demand for these products and thus the demand for wood inputs. GTM attempts to capture the complexity of inter-regional trade by using econometrically estimated demand and supply equations for each region and current trade flows to initialize the model. TSM, on the other hand, is strictly a timber supply model, which does not attempt to measure all trade flows simultaneously. GTM uses econometrically derived estimates of timber supply based on price and total timber inventory. Future supply levels are simulated by the model as price changes and inventory adjusts through growth and harvest. The TSM, however, determines timber supply based on the results of a dynamic social optimization which incorporates the idea of rational expectations. Yearly timber supply is a function of price and the amount of timber in harvestable age classes. Both model types represent distinct approaches based in economic theory.

The Matrix based EFISCEN model is providing long term predictions on the forest resource base in Europe. The input data are forest inventories extrapolated into future with the use of scenarios. These scenarios are based on the problems investigated with the model. Management activities such as thinning felling and regeneration can be projected for the future, as well as production of harvestable wood, biomass, litter and soil carbon content by using ratios for removals and flow charts. (Pussinen et al., EFI; 2001) EFISCEN is not a trade model but can only predict the state of the (European) forests in the future. Long term predictions are most suited as short term variances will not be forecast by modeling.

Supply is only one side of the model, as wood products are a partial factor in the whole economy the assumption is made that some factors like labor cost, interest rate and demand are independent of the supply of wood and dependent on the economic conditions as a whole. The growing demand is also a trend which is endogenous to the trade modeling. GTM uses change in population and per capita income to determine the elasticity of the demand equations, where technology improvement is estimated by using wood-to-product conversion factors. New issues and trends in forestry can be prospected by altering input levels in different scenarios, to incorporate change in technique for harvesting and regeneration, or the wood processing technology, is to estimate the change in efficiency and thus adapt demand posterior. Another factor that can be incorporated is the influence of climatic change on the forest stock. EFISCEN is trying this by adapting the transition probabilities in the simulation matrix for increments. (Pussinen et. al., EFI; 2001)

Sohngen and Sedjo (1997) outline differences between TSM and GTM, and present an empirical comparison for simplified, single region models. Their results suggest that static simulation and optimal control models will behave similarly under steady state conditions, but price, harvest and inventory behavior differ when markets are forced away from these steady state conditions. The differences are most notable when demand shifts outward, and when stocks are distributed unevenly among age classes. Smaller differences occur when inventory is affected by small annual perturbations over many years.

The TSM model predicts larger shifts in harvest levels from region to region than do the other models. This results from harvesting strictly by age class. When one region is short on timber in merchantable age classes, the model quickly substitutes timber from other regions. Static simulation models limit harvest adjustments from region to region because they capture capacity adjustment. Price adjustments, on the other hand, are opposite from this. Rather than shifting harvests from region to region, static simulation models shift prices. Thus, optimal control models will generally predict smooth price trends, and static simulation models may have periods of rapid or slow growth. Part of this difference results from the generally lower stumpage or delivered log demand elasticity used in static simulation models. Sohngen and Sedjo (1997), however, found these results even when the same elasticity were utilized, indicating that this is a general difference between the models.

Given the incredible complexity associated with modeling the future of market behavior and given that none of the models has perfectly predicted price trends, one must ask: what use are these models? Perhaps the best use of these models is in asking “what if,” rather than “how will,” questions. When most model projections are published, for example, the modelers go to great lengths to explain their assumptions and to present alternative scenarios. While modelers usually provide a best guess, scenarios play an important part in understanding how the model operates. Scenario analysis such as this is also frequently used for policy purposes. A model for the effect of interregional effects of price demand ratios does not exist, and can be a useful tool in the prediction of the effect of big availabilities of wood products from southern hemisphere countries on a European export market.

Bilateral trade agreements

New Zealand and Chile are involved in achieving more collaboration to stand strong on the global market. Free Trade Agreements (FTA) and Closer Economic Partnership (CEP) are on the agenda to be signed. Both countries are involved in the p5 economies, together with the USA, Singapore and Australia. These Pacific 5 strive for the removal of trade barriers as imposed by WTO member countries. These proposed policy initiatives have benefited very little from analysis of the possible economic impacts and potential environmental and social side effects. These could be very significant because forests harbor a variety of values beyond being sources of timber.

The removal of barriers can occur on two levels. The tariffs on trade or barriers which are non-tariff measures, mainly established to protect social and ecological functions of domestic markets. The domestic production is often protected with a scaling system of tariffs. The more processed a products is, the higher percentage of import tax is applied. So, unprocessed logs are relatively cheaper to import then value added products. Opening the discussion on the removal of these barriers, major wood producing countries are seeking to encourage the development of their wood engineering industry. With the base of raw material close at hand, these developing industries in producing countries can severely affect the position of already established industries, which firstly have to reach out for other sources of raw material. (Looking at South Korea importing 4 million cubic meters of industrial roundwood per year from New Zealand, what would be the effect of a drastic price increase due to growing processing industries in New Zealand?) Secondly, the competition between new established and old industries would increase, driving prices down, assuming no demand increases.

New Zealand and Chile also entered into a collaboration to push for wood products exports. The group comprises industry associations from some of the world's biggest wood exporters, Canada, South Africa, Australia, the United States, Chile and New Zealand. The removal of non-tariff trade barriers such as having to conform with local fire regulations, building compliance codes and labeling requirements could save New Zealand companies an estimated $170 million a year. (according to the New Zealand Forest Industry Council) It could be even higher if trade became totally tariff-free because that would boost New Zealand export for higher-value products that attracted higher tariffs than its main forestry export, logs. The Asia-Pacific Economic Cooperation lobby group is seeking ways to overcome Asian countries' fire regulations, which are a significant non-tariff barrier to New Zealand timber exports to Asia. The elimination of import taxes (tariffs) for all forest products goes through proposed accords among members of the World Trade Organization (WTO). The APEC countries are advancing discussions on other laws and practices that could be tagged as trade barriers (referred to as ‘non-tariff” measures) and also targeted for removal. Many large and influential forest products companies in the countries bringing forward proposals are strong supporters of these forest product trade liberalization initiatives because they would increase their access to European, Japanese, and many developing country markets. This could lead to an increase in global trade in products such as construction lumber, plywood, particleboard, and furniture. It would also lead to shifts in where timber cutting takes place because it favors those producers best able to reduce costs of forest exploitation.

Trade liberalization can be beneficial for forest conservation and sustainable management if domestic forest conservation policies are well developed and implemented, because it enhances the competitiveness of producers that are more efficient, better managed, less wasteful, and better informed. (Sizer et al., 1999) Liberalization could be particularly threatening to the environment in countries with weak forest protection programs. When other countries move to protect their remaining stands of old growth forest, production may partially shift to unprotected forests in other countries. Demand growth and new technology increase market acceptance of a wider range of species and smaller dimension trees, further threatening currently unexploited forests. On the other hand, introduction of new technology can also improve efficiency and reduce waste.

The basis of trade's threat to forests lies in the imbalance between the progresses that governments and international institutions have made on liberalization of trade compared to the poor showing they have made on building a framework of laws and policies to protect forests. This will require major changes in the *status quo* for both trade policy and forest policy, at both national and international levels. Trade policy institutions must take into account the environmental and social impacts of their current and proposed policies and reform policies to minimize negative impacts. At the same time, the forest protection policy and legal frameworks in many countries need to be strengthened.

Conclusions & recommendations

With the expanding wood industry in both Europe as well as the southern hemisphere countries, an increasing competition for the consuming markets will arise. As the demand for forest products in Europe will not grow as fast as the production of it, new export markets must be sought out, or the industries have to try to cut cost. As a consequence it is clear that active measures will be required to increase the wood products demand, providing potential development options of the sawmilling industries. Active measures are also required to develop export to non-European markets. From the viewpoint of big European wood producers the market is in danger of excluding wood production in urbanized Europe. The wood prices, under influence of increasing demands of the consumer, have risen steadily. Latin America as continent and the different states have played into this trend and offer strong investment opportunities for TNCs, which can produce wood products with cheap labor, low insurance and risk and less regulations.

As the European integration develops, the availability of resources will rise and open opportunities of the European woodworking industries to expand into the further liberated markets of the new member states. Trade with these countries was of course already existent, but further opened up by the EU enlargement. European companies are constantly merging into mega corporations in order to compete and cut costs. The fight for the EU domestic market, as well as the export market will further intensify as global wood processing industries are developing. The use of European raw wood material has for some companies a too high price tag, with the incurring legislation on certification, sustainable production and natural conservation. These last mentioned trends are, compared to countries outside Europe very advanced. The import of unsustainable produced raw material on grand scale must be prevented though. The ecological footprint Europe causes on the rest of the world's resources is already very impressive. Meeting the future demand for forest products, with increasing population and less profitability of harvesting and management operations, will be a big challenge for the future of the European forest sector. Especially because of high availability of cheap wood sources elsewhere, the preference for sustainable raw material sources inside Europe of the woodworking industry must be gained.

Obvious is that the Monterey pine plantations established were not solely meant for the supply of the domestic industries and consumption. The exports of forest products from especially Chile and New Zealand have undergone a transformation from supplying foreign industries to exporting processed products. New Zealand is in this respect less developed, as the largest share of wood products is directly exported, without further processing. Chile has been able to establish a successful secondary industry and does earn more profit from its wood products than New Zealand. The Free Trade Agreements with USA, EU (except Luxembourg) and South Korea have ensured a stable consuming market for Chilean's woodworking products. New Zealand exports mainly to USA, Australia and Asian countries, Chile shares these consumers except Australia, but has more connections in Europe, Southern and Central America.

Pine and Eucalyptus as the fast growing producers of industrial wood have been established with the prospect of lacking material for the determined growth in demand. The perception of the value of the establishment of forest plantations has to do with the state of national economies. Forest plantations can be an incentive for growing construction demands and development. Establishment of new plantations and the exploitation of old growth forest are both influenced by price- demand factors.
Perspectives on forest ownership in Europe, certification of wood products, environmentalism of the consumer, climate change and the influence of illegal logged timber, can qualitatively be discussed by using the quantitative modeling. Incorporating effects of large wood producing countries on a European based model can be a very useful development. What if, in ten or twenty years the large areas of plantations established in the 90's mature, and a big wall of wood will arise? For sheer self-protection such a model should be developed. Understanding the threat on beforehand can give policy makers a step ahead to prepare.

Higher wood prices determine also the effort made to expand wood production into new territories, less accessible or more costly to regenerate. Increasing population and income would spur continued increases in the demand for wood. Insatiable demand for forest products was predicted to outpace the ability of forests to regenerate naturally, causing large gaps between the demand for and supply of timber. As scarcity increases, prices increase, and markets respond with more management and human planting. Thus timber prices will equilibrate demand and supply, giving chance for higher cost industries. Not taken into account in this, is what will happen if prices will not rise, but, due to high availability and lower demand, stabilizes or decreases?

Unless countries that export forest products improve forest protection policies, laws, and practices, further trade liberalization poses a significant threat to efforts to conserve and sustainably manage forests around the world. Demand for forest products is expected to expand with continued human population growth and economic expansion. The upward trend in international trade in these products will also continue. Trade liberalization will accelerate this trend placing further pressure on forests, including those most rich in biological diversity, those inhabited by millions of indigenous and other forest- dependent people, and those critical for maintaining global ecosystem services. Although acceleration of tariff elimination is unlikely to have a large impact on net global trade because most tariffs are already quite low, tariff elimination could significantly impact some products and some markets.

Assured must be that the survival of the woodworking industry does not cost too much damage on ecosystems; therefore the effort of countries to reduce tariffs should be counteracted and condemned. Europe must be proud of its sustainable production nature and promote their products as such. Because of the high standards, it can set an example for other producing regions and improve the market for ecologically sound produced sawmill products. While price-quality proportion mostly affects the purchase conduct of the consumer, the ecological soundness of the product also has a lot to do with this conduct of late. The decision is often made by consumers in the awareness that their ecological footprint, caused by the unsustainable production of wood products, should be as reduced as possible in order to promote biodiversity, social equity and the support of fair trade. Certification of European based wood products is very progressed in comparison to other continents and imposed on forest managers by national and supranational law. These trends have impact on forest management, less harvesting is implied and complete clearfellings are restricted. Forest conservation issues are lowering the supply of raw material to the industry, forcing them to search outside the domestic production. As industrial consumption of roundwood continues to grow, international trade becomes an increasingly important source of wood for the world’s forest industries.

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